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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/224,401 12/31/98 HOSUR

023494 TM02/1122
TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S. 3999
DALLAS TX 75265

EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/224,401

Applicant(s)
Hosur et al.

Examiner
Hanh Nguyen

Group Art Unit
2662



- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

- ☒ Claim(s) 1-45 _____ is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-45 _____ is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☒ The proposed drawing correction, filed on Mar 22, 1999 is ☒ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3
- ☐ Interview Summary, PTO-413
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 29-45 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- Regarding claims 29, the specification does not describe the steps of selecting a diversity pattern, and selecting a symbol pattern corresponding to plural signal sources and plural times.

- Regarding claim 36, the specification does not describe the steps of not transmitting from the third and the fourth antennas during a part of the first time; and not transmitting from the first and the second antennas during a part of the third time.

- Claims 30-36 are rejected because they depend on claim 29.

- Regarding claim 37, the specification does not describe the step of decoding the overlay pattern according to a symbol pattern. However, an overlay pattern that is corresponding to one in "Prior art" labeled Fig.5 is described.

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- Regarding claim 44, the specification does not describe the steps of not decoding a symbol from the third and the fourth antennas during the first time; and not decoding from the first and the second antennas during the third time.

Claims 38-45 are rejected because they depend on claim 37.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- Regarding claim 36, it is not clear what is meant by not transmitting from the third and the fourth antennas during a part of the first time; and not transmitting and from the first and the second antennas during a part of the third time.

- Regarding claim 44, it is not clear what is meant by not decoding a symbol from the third and the fourth antennas during the first time; and not decoding from the first and the second antennas during the third time.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1- 8 and 10-28 are rejected under 35 USC 103(a) as being unpatentable over **Gilhousen et al.** (US Pat. No. 5,056,109) in view of **Sousa et al.** (US Pat. No. 5,832,044).

- Regarding claims 1, 2, 12, 17-19 and 22, **Gilhousen et al.** discloses, in Fig.3, a power control system using CDMA method represented by a base station receiver. A power measurement 60 receives a multiple of mobile unit transmitted signals via an antenna 52, analog receiver 54, and digital data receiver 56 (a measurement circuit receives a first input signal and a second input signal). See col.12, lines 35-60 & Abstract. Fig.6 illustrates a detail power control system of Fig.3. In Fig.6, a power average circuit 118 averages the largest output symbols from decoder 116 and outputs a signal indicative of each average power level to a comparator 120 (the measurement circuit producing an output signal corresponding to a magnitude of the first and the second signal). See col.16, lines 20-27. The comparator 120 also receives a power level set signal indicating a desired received power level set by the control processor along with the output signal outputted from the power average circuit 118. (a control circuit receives the output signal and a reference signal). See col.16, lines 27-30. The comparator 120 compares the two input signals and provides an output signal indicative of the deviation of the average power level from the desired power level (the control circuit is arranged to produce a control signal in response to a comparison of the output signal and the reference signal). See col.16, lines 30-35. **Gilhousen et al.** does not disclose specifically that the first input signal and the second input signal are being transmitted at a first time and from different antennas respectively. **Sousa et al.** discloses a fading resistance transmission that uses either of three types of transmitter diversity: antenna diversity,

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frequency diversity, or time diversity. In particular, these diversity techniques consist of the simultaneous transmission of data modulated signals over a set of L different antennas, L different carrier frequencies, or L different time slots (the first input signal and the second input signal are being transmitted at a first time and from different antennas respectively). See col.3, lines 18-25. Fig.1 shows that the base station has L transmitter antennas, the mobile station has a single antenna, and each of the L links has a different fading amplitude (each input signal has a magnitude). See col.6, lines 25-30. Therefore, it would have been obvious to one having ordinary skill in the art to combine the fading resistance transmission as disclosed by **Sousa et al.** with the power control system using CDMA method as disclosed by **Gilhousen et al.** to arrive at the claimed invention in order not to provide any additional power or bandwidth and to balance the power across multiples antennas.

- Regarding claim 25, **Gilhousen et al.** discloses, in Fig.6, that after the comparator 120 compares the two input signals and provides an output signal indicative of the deviation of the average power level from the desired power level, the output signal is provided to power up/down command generator 122 which generates either a power-up or power-down command to cell-site transmit modulator (receiving at least a control signal transmitted from an external source) for transmission and control of transmitter power of mobile unit N (producing and transmit a transmit power level of each antenna in response to the control signal). See col.16, lines 30-40.

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- Regarding claims 13, 15 and 16, the limitations of these claims have been addressed in claim 1.

- Regarding claims 3, 14 and 20, **Gilhausen et al.** discloses, in Fig.3, that digital data receiver 56 receives the wideband spread spectrum signals for correlating and despreading the mobile unit (first and second input signals is a wideband CDMA). See col.12, lines 50-55.

- Regarding claim 4, the limitation of this claim has been addressed in claim 1.

- Regarding claim 5, the limitation of this claim has been addressed in claim 1.

- Regarding claim 6, the limitation of this claim has been addressed in claim 25.

- Regarding claims 7 and 21, the limitations of these claims have been substantially addressed in claim 1. In addition, **Gilhausen et al.** discloses, in Fig.3, a comparison process between a received power measurement and a preset power level as a proof to show that each of the transmitted input signal has a predetermined value. In particular, when the received power measurement is greater than the preset level, the adjustment command is generated such that the mobile unit transmitter power is reduced. When the received power measurement is less than the preset level, the power adjustment command data bits are generated to indicate that an increase in mobile unit transmitter power is necessary (each of the first and second predetermined signal has a predetermined values). See col.13, lines 1-10.

- Regarding claim 8, the limitation of this claim has been addressed in claims 1 and 7.

- Regarding claim 10, **Gilhausen et al.** discloses that the mobile unit transmitted signal experiences Ray-Leigh fading before arriving at the cell-site receiver. Corrections are made at the

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mobile unit to correct for Ray-Leigh fading in the cell-site transmitted signal (first and second signals are Rayleigh fading parameter estimate). See col.12, lines 1-15.

- Regarding claim 11, **Gilhausen et al.** does not disclose the total path diversity of the first and the second input signals is at least twice a number of transmitting antennas. **Sousa et al.** disclose that the transmission bit rate can be increased with no loss in performance and without using more bandwidth by transmitting two carriers that are in phase-quarature from each antenna. This ensures the $2L$ signals (where L is the number of antennas as discussed in claim 1) do not interfere with one another and the bandwidth efficiency is twice as high (the total path diversity of the first and the second input signals is at least twice a number of transmitting antennas). See col.7, lines 15-27. Therefore, it would have been obvious to one having ordinary skill in the art to combine the fading resistance transmission as disclosed by **Sousa et al.** with the power control system using CDMA method as disclosed by **Gilhausen et al.** to arrive at the claimed invention in order to resist fading and increase the bandwidth efficiency.

- Regarding claim 23, the limitations of this claim have been addressed in claims 1 and 21.

- Regarding claim 24, the limitation of this claim have been addressed in claim 8.

- Regarding claim 26, the limitation of this claim has been addressed in claim 19.

- Regarding claim 27, **Gilhausen et al.** discloses, in Fig.6, if the received power at the cell-site is higher than that desired of mobile unit N, then a power-down command is generated and transmitted to mobile unit N. If the received power at the cell-site is too low, then a power-up command is generated and transmitted. The power adjustment command feedback

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compensates for changes in the inbound channels that are independent of the outbound channels. Thus, the power adjustment command feedback is used to compensate for adjustments in mobile unit transmitter power based on the inbound channel path losses (the respective transmit power level has a same transmit power adjustment for antenna in response to one transmit power control signal). See col.16, lines 41-64.

- Regarding claim 28, the limitation of this claim has been addressed in claim 1.

Claim 9 is rejected under 35 USC 103(a) as being unpatentable over **Gilhousen et al.** (US Pat. No. 5,056,109).

- Regarding claim 9, **Gilhousen et al.** does not disclose the measurement circuit, the control circuit and the estimate circuit are formed on a single integrated chip. However, it is well known in the art to design the measurement circuit, the controller circuit and the estimate circuit on a single integrated chip as described on CDMA-95 standards. Therefore, it would have been obvious to one having ordinary skill in the art to build these circuits on the chip and use the modified chip in **Gilhousen et al.**'s power control system to arrive at the claimed invention.

Claims 29, 32-35, 37, 40-43 and 45 are rejected under 35 USC 103(a) as being unpatentable over **Gilhousen et al.** (US Pat. No. 5,056,109) in view of **Sousa et al.** (US Pat. No. 5,832,044), and further in view of **Bolgiano et al.** (US Pat. No. 5,859,879).

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- Regarding claim 29, **Gilhausen et al.** does not disclose selecting a diversity pattern, symbol pattern having plural elements corresponding to plural signal sources and plural times, and produce an overlay of each element of diversity pattern. **Bolgiano et al.** discloses, in Fig. 1, a wireless communication system that combines time and space diversity to reduce fading. In particular, a data packet which carries digital telephone traffic is transmitted at three different times from three different antennas (symbol pattern having plural elements corresponding to plural signal sources and plural times). See Abstract. The mobile user receives the same data packet at three different times from three different antennas and uses the best data packet to reduce the effect of fading (selecting a diversity pattern). See Abstract. The producing of overlay pattern has been disclosed in "Prior art" labeled Fig. 5. This shows that the overlay pattern is a well-known pattern in time space diversity transmission. Therefore, it would have been obvious to one having ordinary skill in the art to combine the wireless communication system as disclosed by **Bolgiano et al.** with the power control system as disclosed by **Gilhausen et al.** to arrive at the claimed invention in order to select the best signal at the mobile station.

- Regarding claim 37, a limitation of this claim is substantially directed to the same subject matter in claim 29. In addition, **Gilhausen et al.** discloses, in Fig. 6, that the output of filter 114 is provided to a user data decoder circuit 116 which provide user data and largest filter symbols to power circuit 118 (decoding the overlay pattern according to a diversity pattern and symbol a pattern). See col. 16, lines 17-22. Therefore, it would have been obvious to one having ordinary skill in the art to combine the wireless communication system as disclosed by **Bolgiano et al.**

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with the power control system as disclosed by **Gilhausen et al.** to arrive at the claimed invention in order to balance power across transmitting antennas.

- Regarding claims 32 and 40, the limitations of these claims have been addressed in claim 1.

- Regarding claims 33 and 42, the limitations of these claims have been addressed in claims 1 and 29.

- Regarding claim 43, the limitation of this claim has been addressed in claim 1.

- Regarding claim 34, the limitations of this claim has been addressed in claims 1 and 29.

- Regarding claims 35 and 45, the limitations of these claims have been addressed in claim 1.

- Regarding claim 41, the limitations of these claims have been addressed in claim 37.

Claims 30, 31, 38 and 39 are rejected under 35 USC 103(a) as being unpatentable over **Gilhausen et al.** (US Pat. No. 5,056,109) in view of **Sousa et al.** (US Pat. No. 5,832,044), in view of **Bolgiano et al.** (US Pat. No. 5,859,879), and further in view of **Bottomley** (US Pat. No. 5506861).

- Regarding claims 30, 31, 38 and 39, **Gilhausen et al.** does not disclose each of diversity pattern is one of true and a complement of another. **Bottomley** discloses that traditionally, receiving a transmitted sequence or its complements indicates whether the information bit is a +1 or -1, sometimes denoted as "0" or "1". The traditional receiver correlates the received signal with

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the complex conjugate of the bit sequence to produce a correlation value (each of diversity pattern is one of true and a complement of another). See col.2, lines 15-25 & lines 45-58. Therefore, it would have been obvious to one having ordinary skill in the art to combine the method of CDMA demodulating signals as disclosed by **Bottomley** with the power control system as disclosed by **Gilhausen et al.** to arrive at the claimed invention in order to sum the path symbols.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Chen (US Pat. No. 5,982,760) discloses a Method and Apparatus for Power Adaption Control in Closed-Loop Communications.

- Gilhausen et al. (US Pat. No. 5,603,096) discloses a Reverse Link, Closed Loop Power Control in a CDMA System.

- Yoshida et al. (US Pat. No. 5,886,987) discloses a FDD/CDMA Transmission / Reception System.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Nguyen whose telephone number is (703) 306-5445. The examiner can normally be reached on Monday-Friday from 8:00AM to 5:00 PM.

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If attempts to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on (703) 305-4744. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

7. Any response to this action should be mailed to :

Commissioner of Patents and Trademarks

Washington D.C. 20231

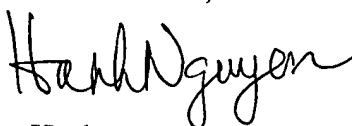
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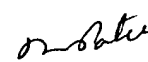
Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Dr.

Arlington VA, Sixth floor (Receptionist)

November 10, 2000



Hanh Nguyen


Ajit Patel
Primary Examiner